What is claimed is:

1. A power amplifying method, comprising the steps of:

amplifying a high-frequency signal modulated by an input signal;

generating an inverted envelope signal by using the input signal or the high-frequency signal, the inverted envelope signal having an inverted envelope which is inverted one of both envelopes of the high-frequency signal, and

injecting the inverted envelope signal into the high-frequency signal or the amplified high-frequency signal.

2. The power amplifying method according to claim 1, wherein based on information about a signal level of the amplified high-frequency signal or a signal level of a modulation frequency band included in the high-frequency signal, adjustment is performed on (a) amplitude of the inverted envelope signal and/or (b) a phase of the inverted envelope signal or a phase of the high-frequency signal before the injecting step so that a signal level of the modulation frequency band is substantially minimum.

3. A power amplifier, comprising:

amplifying means of amplifying a high-frequency signal modulated by an input signal, and

inverted envelope generating means of generating an inverted envelope signal by using the input signal or the high-frequency signal, the inverted envelope signal having

an inverted envelope which is inverted one of both envelopes of the high-frequency signal,

wherein the inverted envelope signal is injected into the high-frequency signal or the amplified high-frequency signal.

4. The power amplifier according to claim 3, further comprising:

first amplitude adjusting means of adjusting amplitude of the inverted envelope signal,

first phase adjusting means of adjusting a phase of the high-frequency signal or the inverted envelope signal, and

a control circuit of outputting a control signal to the first amplitude adjusting means and the first phase adjusting means based on information about a signal level of the amplified high-frequency signal or a signal level of a modulation frequency band included in the high-frequency signal,

wherein the inverted envelope signal having been adjusted in amplitude or phase is injected into the high-frequency signal or the amplified high-frequency signal, and

the control circuit controls the first amplitude adjusting means and/or the first phase adjusting means so that the modulation frequency band has a substantially minimum signal level.

5. The power amplifier according to claim 4, further comprising a distortion generating circuit generating a

distorted signal for canceling distortion generated from the amplifying means and injecting the distorted signal into an input side of the amplifying means.

6. The power amplifier according to claim 5, wherein the inverted envelope signal is injected into the amplified high-frequency signal.

7. The power amplifier according to claim 5, wherein the inverted envelope signal is injected via the distortion generating circuit to the high-frequency signal inputted to the amplitude means.

8. The power amplifier according to claim 5, further comprising a baseband part of generating an I signal and a Q signal orthogonal to the I signal from the input signal, and

a demodulating part demodulating the modulated high-frequency signal into the I signal and the Q signal,

wherein the distortion generating circuit generates a distorted signal for canceling distortion in the amplified high-frequency signal, based on the I signal and Q signal generated in the baseband part and the I signal and Q signal outputted from the demodulating part.

9. The power amplifier according to claim 5, wherein the distortion generating circuit generates the distorted signal when the inverted envelope signal adjusted in amplitude or phase is inputted.

10. The power amplifier according to claim 4, wherein the inverted envelope generating means comprises an envelope detector of detecting an envelope of the high-frequency signal and a sign inversion circuit of inverting a sign of the envelope-detected signal, and

the envelope-detected signal having the inverted sign is outputted as an inverted envelope signal.

11. The power amplifier according to claim 10, wherein the inverted envelope signal outputted from the inverted envelope generating means is injected into an input side of the amplifying means.

12. The power amplifier according to claim 9, further comprising:

second amplitude adjusting means of further adjusting amplitude of the inverted envelope signal inputted to the distortion generating circuit, the inverted envelope signal having been adjusted in amplitude or phase, and

second phase adjusting means of further adjusting a phase of the inverted envelope signal inputted to the distortion generating circuit, the inverted envelope signal having been adjusted in amplitude or phase,

wherein amplitude and/or a phase of a signal inputted to the distortion generating circuit is further adjusted by the second amplitude adjusting means and the second phase

adjusting means so that the modulation frequency band has a substantially minimum signal level.

13. The power amplifier according to claim 4, further comprising a baseband part generating an I signal and a Q signal orthogonal to the I signal,

wherein the inverted envelope generating means calculates $-(I^2 + Q^2)^{1/2}$ based on the I signal and the Q signal and outputs a result as the inverted envelope signal.

14. The power amplifier according to claim 8, wherein the distortion generating circuit is provided in the baseband part.

15. The power amplifier according to claim 13, wherein the inverted envelope generating means is provided in the baseband part.

16. The power amplifier according to claim 4, further comprising first level detecting means of detecting a signal level of the amplified high-frequency signal,

wherein the first amplitude adjusting means and/or the first phase adjusting means is controlled by the control circuit based on information acquired by the first level detecting means about the signal level of the amplified signal.

17. The power amplifier according to claim 4, further comprising:

a low-pass filter connected to an output side of the amplifying means, and

second level detecting means connected to an output side of the low-pass filter,

wherein a signal of the modulation frequency band is taken out from the amplified high-frequency signal by the low-pass filter, a signal level of the modulation frequency band is detected by the second level detecting means, and the first amplitude adjusting means and/or the first phase adjusting means is controlled by the control circuit so that the modulation frequency band has a substantially minimum signal level.

18. The power amplifier according to claim 12, further comprising first level detecting means of detecting a signal level of the amplified high-frequency signal,

wherein at least one of the first amplitude adjusting means, the first phase adjusting means, the second amplitude control means, and the second phase control means is controlled by the control circuit based on information acquired by the first level detecting means about a signal level of the amplified signal.

19. The power amplifier according to claim 12, further comprising:

a low-pass filter connected to an output side of the amplifying means, and

second level detecting means connected to an output side of the low-pass filter,

wherein a signal of the modulation frequency band is taken out from the amplified high-frequency signal by the low-pass filter, a signal level of the modulation frequency band is detected by the second level detecting means, and the first amplitude control means, the first phase control means, the second amplitude control means, and the second phase control means are controlled by the control circuit so that the modulation frequency band has a substantially minimum signal level.

20. The power amplifier according to claim 4, further comprising third level detecting means of detecting a signal level of a high-frequency signal before the signal is inputted to the amplifying means,

wherein the first amplitude control means and/or the first phase control means is controlled based on the signal having been subjected to level detection.

21. The power amplifier according to claim 12, further comprising third level detecting means of detecting a signal level of a high-frequency signal before the signal is inputted to the amplifying means,

wherein at least one of the first amplitude control means, the first phase control means, the second amplitude control means, and the second phase control means is controlled based on the signal having been subjected to level detection.

22. The power amplifier according to claim 12, wherein the second amplitude adjusting means and/or the second phase adjusting means is controlled based on information about a signal level of the input signal or a signal level of the signal outputted from the power amplifier.

23. The power amplifier according to claim 9, wherein the inverted envelope signal generated from the inverted envelope circuit or the inverted envelope signal having been adjusted in amplitude or phase is inputted to an input side of the distortion generating circuit or the distortion generating circuit via a series circuit constituted of a coil and a capacitor.

24. The power amplifier according to claim 4, wherein the inverted envelope signal generated from the inverted envelope circuit or the inverted envelope signal having been adjusted in amplitude or phase is injected to the high-frequency signal or the amplified high-frequency signal via a series circuit constituted of a coil and a capacitor.

25. The power amplifier according to claim 23 or 24, wherein a resistor is used instead of the coil.

26. A communication apparatus, comprising:

a transmitter which transmits a transmission signal and has a power amplifier described in claim 4, and

a receiver of receiving a signal to be received.